The Impact of Temporary Contracts on Gross Job and Worker Flows

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Abstract

Based on direct information on hires and separations for 10.000 Swedish establishments during 11 years we report new evidence that around half of gross job and worker flows stem from temporary contracts which account for only around 10 percent of employment. The share of temporary contracts is positively correlated to employment growth indicating that firms use temporary jobs as a buffer in labor adjustment. Job reallocation for temporary contracts is acyclical. Service establishments with a high share of temporary employment exhibit acyclical job reallocation while permanent jobs in manufacturing is countercyclical.

JEL-codes: J21, J23

KEYWORDS: Job creation and Job destruction, Worker Flows, Dual Labor Markets, Temporary Employment.

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1 Introduction

Studies of gross labor flows for the US and many European countries report similar average job creation and job destruction flows aggregating temporary and permanent contracts, despite the fact that labor markets in these countries vary greatly with respect to labor legislation restricting hiring and firing of workers on short and long-term contracts.[1] Temporary employment is by definition characterized by strong volatility and thus high turnover of jobs and workers. When firms face high adjustment costs associated with permanent contracts as is the case in Sweden and many other European countries, high levels of aggregate job or worker flows can be dominated by high levels of labor flows associated with temporary contracts. On the other hand, when labor legislation does not affect the adjustment costs associated with various types of contracts, as is the case in the US, aggregate flows are likely to be more evenly distributed across contract types. This suggests that similar levels of aggregate labor flows may mask differences in flows due to the differences in contract types. This in turn implies that a similar aggregate level of labor flows does not necessarily indicate a similar pattern of flexibility in the labor market.

Employment protection legislation in Sweden restricts hiring and firing of workers. In terms of termination costs of employment contracts, the labor law (LAS) is more restrictive for permanent contracts than for temporary ones. Time-limited contracts are only allowed for (i) one trial period of six months, (ii) seasonal or temporarily excessive work loads, (iii) replacement of employees on leave, (iv) workers over 67 years and a few other cases. This is not unique for Sweden. Labor protection laws in many European

[1]See Leonard (1987), Dunne *et al.* (1989), Davis & Haltiwanger (1990,1992) for job flows. Abowd *et al.* (1999), Anderson & Meyer (1994), Burda & Wyplosz (1994), Lane *et al.* (1996), Hamermesh (1996) and Albaek & Sörensen (1998) study both job- and worker flows. For studies of gross job flows in Sweden see Persson (1999) and Andersson (1999).

countries discriminate between short and long term contracts (see OECD (1993, 1996)). In the presence of large hiring and firing costs associated with permanent contracts, firms can reduce adjustment costs by using temporary workers as a buffer for employment adjustment.[2]

The purpose of this paper is to examine job and worker flow dynamics for temporary and permanent contracts. Our data contain quarterly direct information on hires and separations for permanent and temporary workers. The information is from a representative sample of approximately 10,000 Swedish private establishments covering the period 1989:2 – 1999:4. Data of this kind has not previously been used to study labor flow dynamics. Earlier research on gross labor flows has been based on data that do not permit distinguishing between different types of employment contracts (an exception is Abowd *et al.* (1999)).

The only result on gross labor flows by contract types reported in previous research is in Abowd *et al.* indicating that in France 2/3 of all hires are on short term contracts and more than half of all separations are due to the end of short term contracts. This indicates that short-term contracts account for a substantial part of labor flows. This paper contributes to the literature by analyzing the impact of temporary contracts on gross job and worker flows during a sufficiently long period, thereby enabling an analysis of the cyclical variation of these flows.

Our results are as follows. Temporary contracts account for approximately 10 percent of all contracts but stand for half of all gross job (and worker) flows. This means that gross job (and worker) flow rates for temporary contracts are circa 10 times larger than job flows (and worker) for permanent contracts.

The dominant picture from previous research is that job turnover is

[2]See Saint-Paul (1996), Cabrales & Hopenhayn (1997) and Alonso-Borrego (1998) for analyses of temporary and permanent employment.

counter-cyclical. Our results imply that job reallocation associated with temporary contracts is acyclical in both the manufacturing and non-manufacturing sectors. For permanent contracts, a countercyclical pattern for job reallocation is found in manufacturing only.

We examine worker flows based on direct information on reported hires and separations and find that on an annual basis, permanent worker turnover is on average 8 percentage points larger than permanent job turnover. This is much lower than previously observed differences between total worker and job flows, implying that previously reported worker turnover rates are highly dominated by employer changes among temporary workers. The low excess worker reallocation for permanent jobs that we observe could reflect a low fraction of poor job-matches. For instance, if costs for labor turnover are high, more effort is made to secure a good match. Our low rate of excess worker reallocation for permanent contracts would then reflect good matches as a result of cautious hiring policies. Another explanation is that the employment protection law reduces the lay-off rate for low-productivity workers with permanent contracts. This, however, takes place at the cost of a higher turnover rate for temporary workers.

Considering the variation over time of worker turnover, it is reasonable to believe that workers try to improve their job matches in good times when jobs are plentiful. Our results indicate that worker turnover for all jobs is strongly procyclical in the entire private sector. Analysing the cyclical pattern of worker turnover, by industry we report evidence indicating that the aggregate result reflects the procyclical pattern of worker turnover in the non-manufacturing sectors.

Our results for job reallocation and worker reallocation implies that excess worker reallocation is strongly procyclical. In all cases, except for permanent contracts within manufacturing, the procyclical pattern of excess worker reallocation is a result of procyclical worker mobility. The procyclical pattern

of excess worker turnover in manufacturing simply reflects the countercyclical pattern of job reallocation. The overall message is that excess worker mobility is worker-driven in services and job-driven in manufacturing.

The remainder of the paper is organized as follows. The data is described in Section 2 and measurement issues are discussed in Section 3. Section 4 presents the results for the pattern of gross job flows. Worker flows are investigated in Section 5. Section 6 concludes the paper.

2 Data

The data are from the Short Term Employment Statistics (*Kortperiodisk Sysselsättningsstatistik*) collected by Statistics Sweden (SCB). These data contain quarterly information on worker turnover and employment stocks for a representative panel of around 10,000 establishments of all sizes in the non-agricultural private sector, during the period 1989:2 – 1999:4. The information on establishment employment as well as hires and separations is supplied for both permanent (time unlimited) and temporary (time limited) contracts, separately for men and for women (see Appendix A for data description). Data are consistent with the Swedish Labor Force Surveys according to results reported by Statistics Sweden (SCB) and our own computations. For details see Arai and Heyman (2000).

The structure of the survey is as follows. A representative sample is drawn from the population of private-sector establishments of all sizes in Sweden, stratified according to industry affiliation and establishment size. Establishment with more than 99 employees are sampled with probability one. In order to update the sample to include newly started establishments and to avoid attrition due to exits, 10 percent of the sample is replaced every year for the period 1989-1994, and every six months starting in 1995.

The establishments are randomly divided into three equal groups. Each

group responds every quarter to questions on employment and worker turnover for one month each. The number of employees refers to a particular date in the month, while separations and hires refer to flows during the entire month. As an example, one third of the sampled establishments in the first quarter (second quarter) report information for January (April) , while the other two groups report the corresponding information for February (May) and March (June). This sampling strategy improves the precision of reported information on hires and separations in comparison to a strategy of collecting information on worker flows for the entire quarter. The establishment's response on hires and separations refer to a period of one month and are thus expected to yield reliable information. We know of only two other studies that use direct information on worker flows. Hamermesh (1996) with Dutch firm data and Abowd *et al.*(1999) with French establishment data, also have direct information on hires and separations. These data sets, however, cover only a few years each. Our data, covering more than a decade, avoids the problem of capturing a particular state in the business cycle which may be the case when data covers only 2-4 years.

Note that the sampling strategy here should not be confused with monthly data since the information rendered does not refer to a particular month but rather a random month. The quarterly flows are simply three times larger than the flow during a random month. The sample strategy yielding information on all months of a quarter is such that aggregated data on a sufficiently large number of establishment yield an unbiased estimate of hires and separations for a quarter since the establishment are randomly divided in three groups reporting for different months.

3 Measuring Job and Worker Flows

The standard measure for job flows is the changes in the stock of employees over time. Job flows can also be computed from direct information on worker flows into and out of establishments. Our measures for job creation rate (JCR) and job destruction rate (JDR), based on direct information on hires (h_{et}) and separations(s_{et}) for establishment e with the number of employees n_{et} during period t in sector k, are as follows.

$$JC(D)R_{kt} = \Sigma_e(|h_{et} - s_{et}|)/n_{et}; \qquad if \quad h_{et} \geq (\leq) s_{et}$$

Our measure can be compared to the standard measure of job creation (destruction) rates, given as follows.

$$JC(D)R_{kt} = \frac{\Sigma_e(|n_{et} - n_{e,t-1}|)}{\Sigma_e 0.5(n_{et} + n_{e,t-1})}; \qquad if \quad n_{et} \geq (\leq) n_{e,t-1}$$

Using our data, the standard job flow measures yield changes in the stock of employees between the middle of two subsequent quarters, while our measure based on reported hires and separations refer to flows during a quarter. A comparison of flows calculated using these different sources of information serves as a test of logical consistency of the data. The changes in these job flows are very similar. Considering permanent contracts, the two measures for gross job creation have a correlation of 0.77. The corresponding correlation for gross job destruction is 0.74. Net employment changes based on the two measures are essentially identical (see Arai and Heyman (2000)).[3]

[3]Differences in gross flows based on the two measures might be due to the impact of measurement error on the two measures. The measurement errors sum up and generate a false flow when the errors in the stock of employees (or hires and separations) are not positively and perfectly correlated over time (or across hires and separations). When the errors are positively but not perfectly correlated, there will be false flows that amount to the differences in the errors. The errors in the flow-based measure stems from the same reporter at the same time while the errors in the stock measure stem from two points in

Measuring worker flows in our data is straight forward. Hires and separations are measured directly in our data while previous studies must rely on employer switches for identifying hires and separations.[4]. These two measures are quite comparable when we deal with contracts of longer durations. Considering more time-limited contracts, however, differences in the two measures can be considerable since the measure for worker flows based on employer switches misses all within measurement-dates worker flows.

To obtain the highest possible comparability between job and worker flows, especially regarding contract types, we rely on our direct measures of job and worker flows.

4 Job Flows

Annual job creation for permanent contracts ranges between over 10 percent at the peak of the economic boom in 1989 to below 5 percent at the bottom of the slump in 1993. Gross job destruction for permanent contracts varies between 8 percent in 1995 and 13 percent in 1992. This can be compared with job flow rates for temporary contracts that are on average 10 times larger (see Table 1).

TABLE 1 ABOUT HERE

The very high flow rates for temporary contracts indicate that temporary contracts function as an adjustment buffer. To further examine this,

time and possibly from two different reporters. This implies that the stock measure is more vulnerable to measurement errors compared to the flow-based measure. The job flows for temporary contracts are higher when computed on the basis of net hires and separations compared to the change in the stock employees on temporary contracts. A reason for this difference is that the establishments are asked to report the stock temporary workers during a certain day but exclude temporary workers, working on hourly basis, that are absent that particular day. These workers are included in the hires and separations data and influence the magnitude of job creation or destruction computed on the basis of net hires and separations.

[4]Exceptions are Hamermesh *et al.*(1996) and Abowd *et al.*(1999)

we analyze the relationship between share of temporary contracts and variation in net employment over time. First we find that the share of temporary contracts in expanding establishments is 13 percent while this share is 8 percent in shrinking establishments. Moreover, we estimate a model with change in the share of temporary employment ($\Delta TEMP$) at the establishment level as the dependent variable and net employment change (ΔNET) as the explanatory variable controlling for establishment fixed effects ($\Delta TEMP_{it} = \beta \Delta NET_{it} + \nu_i + \varepsilon_{it}$ for establishment i in time t). The estimated coefficient is + 0.26 and highly significant ($p = 0.000$). These results clearly indicate that establishments use temporary contracts to expand, and lay off workers on temporary contracts as they reduce employment.

The employment share of temporary jobs is around 10 percent in the private sector varying between 6 percent in manufacturing and 12 percent in services. Annual job reallocation rates, for permanent contracts, are on average 13 percent in manufacturing compared to 20 percent in non-manufacturing. Examining job flows in 14 industries, job reallocation is found to be largest in the Hotel and Restaurant, Construction and Service sectors (See Table 2). The lowest job reallocation rates are observed in Food, Mining and Electricity, sectors with a rather low fraction of temporary employment. Job-reallocation is positively correlated to the share of temporary contracts which exhibits a procyclical pattern according to our aggregated time-series data as well as our panel of 14 industries.

TABLE 2 ABOUT HERE

Previous studies examine the cyclical pattern of gross job flows based on raw correlations on aggregated time-series. Aggregated job reallocation for all contract types can vary as a result of firms' adjustment during the business cycle and as a result of sectoral shifts. The aggregated measures are sensitive to changes in the relative employment shares of various industries

with different shares of temporary employment. As an example, the share of manufacturing employment with only 6 percent temporary jobs (and thus low job reallocation rates) decreased from 39 percent in 1989 to 32 percent in 1999 in Sweden.

Raw correlations using industry time-series data indicate that job reallocation is pro-cyclical in Trade, Transport, Banking and Services while Metal and Machinery, Construction, Chemistry and Textile exhibit significant counter cyclical pattern. For other sectors job reallocation is acyclical. The previous findings on counter-cyclical job reallocation is supported in our data only for permanent contracts in the traditional manufacturing industries. These findings are in line with Boeri (1996) suggesting that the countercyclical job reallocation is specific to manufacturing. Foote (1998) argues that the observed countercyclical job reallocation is compatible with a sluggish labor adjustment in combination with a decreasing employment trend.

We examine the cyclical pattern of gross job flows by means of our panel of 14 industries over 43 quarters. In this way we exploit the rich variation of various industry cycles and can estimate overall as well as within-industry cyclical patterns of job flows. Results reported in Table 3 indicate that job reallocation for all types of contracts is acyclical in specifications with and without industry fixed effects. The same pattern is observed for job reallocation for permanent contracts (see panel a, Table 3).

TABLE 3 ABOUT HERE

Separate regressions for manufacturing and services based on our panel of industries disclose a conflicting pattern. We find a stable counter-cyclical pattern of job reallocation for permanent contracts in manufacturing while job reallocation in services exhibits an acyclical pattern.

Our conclusion is that industries that can adjust employment by using temporary workers are characterized by smooth job reallocation and thus do

not exhibit any cyclical pattern in job reallocation. The observed counter-cyclical job reallocation in manufacturing might reflect this sector's limited possibilities of using temporary contracts as an adjustment buffer which leads to sluggish labor adjustment.

5 Worker Flows

Few previous studies deal with both job and worker flows. Studies using matched worker-establishment data all report extremely high rates of worker reallocation. Lane *et al.* (1996) report a quarterly worker reallocation rate of 24 percent in the manufacturing sector in the state of Maryland, indicating that roughly every worker experiences a hiring or separation during one year. Persson (1999) reports a 50 percent annual worker reallocation for all Swedish establishments except construction. Albaek & Sörensen (1998), studying the Danish manufacturing sector, find an annual worker reallocation of 57 percent. These studies estimate hires and separations by identifying employer switches. This procedure is very sensitive to the fraction of temporary to total employment. Temporary workers switch jobs often and temporary jobs are often filled by different workers during different time periods.

Results based on directly observed hires and separations are reported in Table 1 and in Figures B1-B3 in Appendix B. Notice that our direct hires and separations cover all employer switches, while previous studies cover only a part of hires and separations using information on employer affiliations for two dates. On the other hand, given that permanent jobs usually last more than a year, computing employer switches for permanent workers yields a good estimate of total hires and separations.

Permanent hires exhibit high variation over time, ranging from nearly 18 percent in 1989 to a low of 6 percent in 1993. The mean hiring rate equals 12 percent. The corresponding figure for the separation rate is 14 percent,

varying between 11 percent in 1996 and 18 percent in 1990. Despite a severe net employment contraction during 1991-94, some firms still hired at a rate equal to half the job destruction. These simultaneous hires and separations indicate heterogeneity in firms' labor demand. However, we find that expanding establishments hire around 80 percent of total hires and contracting establishments stand for 80 percent of total separations.

Hires and separations associated with temporary contracts are extremely large. The total worker reallocation is around 46 percent which is comparable to worker reallocation rate for all workers reported in earlier studies for Sweden and Denmark. This can be compared with a worker reallocation rate of 25 percent for permanent contracts reported above, implying that around half of the estimated worker turnover in earlier studies originate from a relatively small (10 percent) but extremely mobile group of temporary workers.

Considering over time variation of worker turnover, it is reasonable to believe that workers try to improve their job matches in good times when jobs are plentiful. Results in panel *a* Table 4 indicate that worker turnover is procyclical in the private sector. Results in panel *b* and *c* disclose that the overall results are dominated by non-manufacturing industries. Worker turnover for all jobs is strongly procyclical in services while worker mobility seem to be procyclical only within manufacturing industries (when we control for industry fixed effects). For permanent contracts the procyclical worker turnover pattern is only found in Services.

TABLE 4 ABOUT HERE

Our results for job reallocation and worker reallocation imply that excess worker reallocation is strongly procyclical. In all cases, except for permanent contracts in manufacturing, the procyclical pattern of excess worker reallocation is a result of procyclical worker mobility. The procyclical pattern of excess worker turnover in manufacturing simply reflects the countercycli-

cal pattern of job reallocation. The overall message is that excess worker mobility is worker driven in services and job driven in manufacturing.

We observe an excess worker reallocation (the difference between worker and job reallocation) of 8 percent for permanent jobs implying that between 4 and 8 percent of permanent workers change jobs to improve their job-match, or to leave or enter employment. This can be compared with excess worker reallocation for temporary contracts that is on average approximately 80 percent annually implying that between 40 and 80 percent of temporary workers experience jobs switches that are not induced by creation or destruction of temporary jobs.

Our overall low rate of excess job turnover for permanent contracts might reflect good matches as a result of cautious hiring policies due to high firing costs. Another explanation is that the employment protection law reduces the lay-off rate for low-productivity workers with permanent contracts. This, however, takes place at the cost of a higher turnover rate for temporary workers. One conclusion is that the Swedish labor market exhibits a clear pattern of dualism associated with permanent and temporary employment.

6 Conclusions

The main message of the paper is that the distinction between permanent and temporary contracts is crucial in analyzing job and worker flows especially when labor protection laws discriminate between short and long term contracts.

Using direct information on hires and separations, we report results indicating that previous findings on labor flows, aggregated over all contract types, are partly dominated by unstable temporary jobs and mobile temporary workers. Gross job and worker flows vary strongly in levels. Results imply that worker and job turnover for temporary contracts is around 10

times higher than worker and job turnover for permanent contracts.

The share of temporary contracts varies with industry structure and changes as a result of sectoral shifts. This implies that cross country comparisons, as well as examinations of the dynamics of job and worker flows for all contracts, based on aggregated time-series data can be distorted by the impact of the share of temporary labor on gross labor flows.

We find no clear cyclical pattern of job reallocation with the exception of permanent contracts in manufacturing which are characterized by a low fraction of temporary contracts. Services, employing a higher fraction of temporary contracts, exhibit no cyclical pattern in job reallocation implying that establishments within the service sector use temporary contracts as an adjustment buffer and can more smoothly adjust their labor input.

Our results for job reallocation and worker reallocation implies that excess worker reallocation is strongly procyclical. The procyclical pattern of excess worker reallocation is a result of procyclical worker mobility in services. The procyclical pattern of excess worker turnover in manufacturing simply reflects the countercyclical pattern of job reallocation. Excess worker mobility is worker driven in services and job driven in manufacturing.

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Tables and Figures

Table 1. Annual net and gross labor flow rates 1989-1999 (percent).

			All Jobs			Permanent Jobs			Temporary Jobs		
Year	Temp	Δ E	J R R	W R R	E W R	J R R	W R R	E W R	J R R	W R R	E W R
1989	9	0	30	55	25	19	34	15	167	246	78
1990	9	–1	30	53	23	21	35	14	159	235	75
1991	8	–2	27	41	14	18	24	06	156	227	70
1992	8	–3	28	40	12	18	22	03	169	256	86
1993	8	–2	28	40	11	16	20	04	177	249	71
1994	10	0	30	45	14	17	23	06	182	247	64
1995	10	0	29	46	16	17	24	07	170	239	68
1996	10	–1	28	42	14	15	20	05	170	240	70
1997	10	0	32	50	18	17	24	07	189	282	92
1998	10	0	31	53	21	18	27	08	163	261	98
1999	11	+1	31	52	21	19	28	09	150	239	89
Mean	9.5	-1	30	46	17	18	25	8	169	250	79
MAX	11	1	32	55	25	21	35	14	190	282	98
MIN	8	-3	27	40	11	15	20	3	150	228	64
SD	1	1	2	6	5	1.6	5	4	11	14	10

NOTES: Temp is the share of temporary contracts and ΔE is net employment change. JRR , WRR and EWR are Job-, Worker- and Excess- Worker Reallocation Rates.

Table 2. Annual gross labor flow rates by industry 1989-1999 (percent).

		All Jobs			Permanent Jobs			Temporary Jobs		
Industry	Temp	JRR	WRR	EWR	JRR	WRR	EWR	JRR	WRR	EWR
Manufacturing	6	22	33	11	13	18	6	206	267	61
Mining	7	25	40	15	11	14	3	254	377	122
Chemistry	6	21	32	11	13	19	6	200	252	53
Wood & Paper	6	21	33	11	13	18	5	187	260	73
Textile	4	23	30	08	17	21	5	221	251	30
Machinery	4	20	30	10	13	19	6	224	272	47
Electricity	4	15	24	09	08	11	3	193	271	78
Non-Manufacturing	12	33	53	20	20	29	8	156	237	81
Construction	9	38	51	12	24	29	5	210	269	60
Real Estate	11	32	45	13	17	23	5	179	218	39
Food	14	36	57	21	12	18	6	207	288	80
Hotel & Rest.	27	67	137	70	33	55	21	186	365	180
Banking	7	20	29	09	12	18	6	150	174	24
Transport	10	30	51	21	19	30	10	153	241	87
Trade	11	31	48	17	20	28	8	145	212	67
Misc. Services	12	34	56	22	22	31	10	147	232	85

NOTES: Temp is the share of temporary contracts. JRR , WRR and EWR are Job-, Worker- and Excess- Worker Reallocation Rates.

Table 3. Cyclical pattern of job reallocation rate (JRR), 1989:2-1999:4. Employment weighted regressions. Dependent variable is JRR for different contracts. Robust standard errors in parentheses. Boldface coefficients are significant at conventional levels.

	All Jobs		Permanent Jobs	
a: Private Sector				
Δ Employment	0.21	–0.03	0.21	–0.04
	(0.29)	(0.15)	(0.14)	(0.08)
Industry Dummies	NO	YES	NO	YES
Quarterly Dummies	YES	YES	YES	YES
R^2	0.07	0.77	0.13	0.66
OBS	602	602	602	602
b: Manufacturing				
Δ Employment	-0.44	-0.11	**-0.29**	**-0.29**
	(0.30)	(0.17)	(0.08)	(0.08)
Industry Dummies	NO	YES	NO	YES
Quarterly Dummies	YES	YES	YES	YES
R^2	0.23	0.67	0.11	0.20
OBS	258	258	258	258
c: Non-manufacturing				
Δ Employment	-0.16	-0.04	0.12	0.06
	(0.34)	(0.20)	(0.16)	(0.11)
Industry Dummies	NO	YES	NO	YES
Quarterly Dummies	YES	YES	YES	YES
R^2	0.15	0.71	0.00	0.51
OBS	344	344	344	344

Table 4. Cyclical pattern of worker reallocation rate (WRR), 1989:2-1994:4. Employment weighted regressions. Dependent variable is WRR for different contracts. Robust standard errors in parentheses. Boldface coefficients are significant at conventional levels.

	All Jobs		Permanent Jobs	
a: Private Sector				
Δ Employment	**1.1**	**0.79**	**0.68**	**0.35**
	(0.46)	(0.20)	(0.22)	(0.14)
Industry Dummies	NO	YES	NO	YES
Quarterly Dummies	YES	YES	YES	YES
R^2	0.08	0.80	0.04	0.58
OBS	602	602	602	602
b: Manufacturing				
Δ Employment	-0.41	**0.52**	0.04	0.05
	(0.48)	(0.27)	(0.15)	(0.15)
Industry Dummies	NO	YES	NO	YES
Quarterly Dummies	YES	YES	YES	YES
R^2	0.20	0.64	0.03	0.06
OBS	258	258	258	258
c: Non-manufacturing				
Δ Employment	0.81	**0.94**	**0.61**	**0.57**
	(0.61)	(0.29)	(0.31)	(0.22)
Industry Dummies	NO	YES	NO	YES
Quarterly Dummies	YES	YES	YES	YES
R^2	0.06	0.77	0.03	0.47
OBS	344	344	344	344

Appendix A: Description of the Variables

Permanent employees: All employees with a time-unlimited employment contract at the middle of the survey month.

Self-employed and working shareholders are considered to be permanent workers. Only firms with at least one permanent employee is included.

Temporary employees: All employees with a time-limited employment contract at the middle of a the survey month.

Employees employed on an hourly basis, not present on the actual date, are not included.

Permanent Hires: The number of individuals hired on a time-unlimited basis during the survey month.

Temporary Hires: The number of individuals hired on a time-limited basis during the survey month. Firms report hires on temporary contracts in the second quarter that are systematically higher than the quits in the second and third quarters. This implies a large increase in the share of temporary contracts that is not consistent with the changes in the stock of employees on temporary contracts, as measured in our data. A large number of temporary workers are hired during the summer June-August and especially in July (the vacation month in Sweden) to fill up vacancies during ordinary employees' vacation. Subsequent quits among these hired temporary workers are probably underreported. Temporary workers might not formally be registered as quitting after the end of the summer since many of these workers remain in the pool of temporary workers on hourly basis for some time. To correct for this, hires for temporary contracts were replaced in 10 percent of the cases by hires that are consistent with the average change in the stock of temporary workers during previous and subsequent quarter if $hire_t > 2.quit_t + quit_{t+1}$ for all quarters.

Separations, Permanent Contracts: The number of individuals separated on a time-unlimited basis during the survey month.

Separations, Temporary Contracts: The number of individuals separated on a time-limited basis during the survey month.

Industry Classification: The 14 industry classification corresponds roughly to the two-digit system of industry classification. Aggregation of some industries was necessary to match the industry classification (SNI69) for observations from the period 1989-1994 and the new system (SNI92) for the period 1995-1998. This leads to some minor misclassification.

Appendix B: Figures.

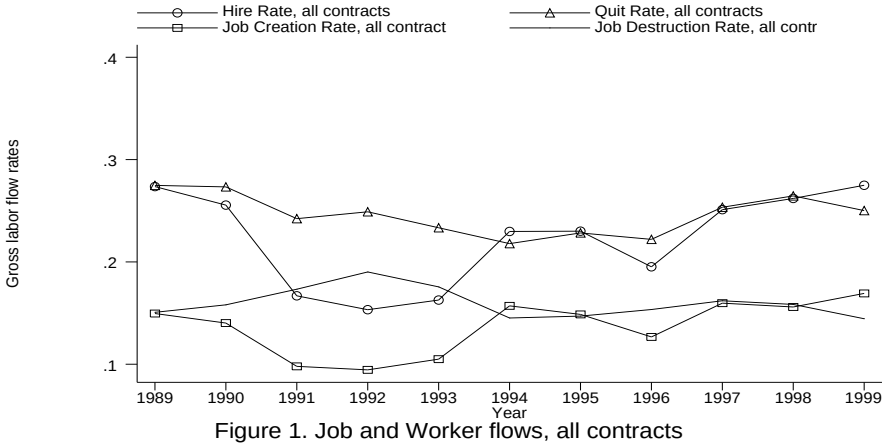

Figure 1. Job and Worker flows, all contracts

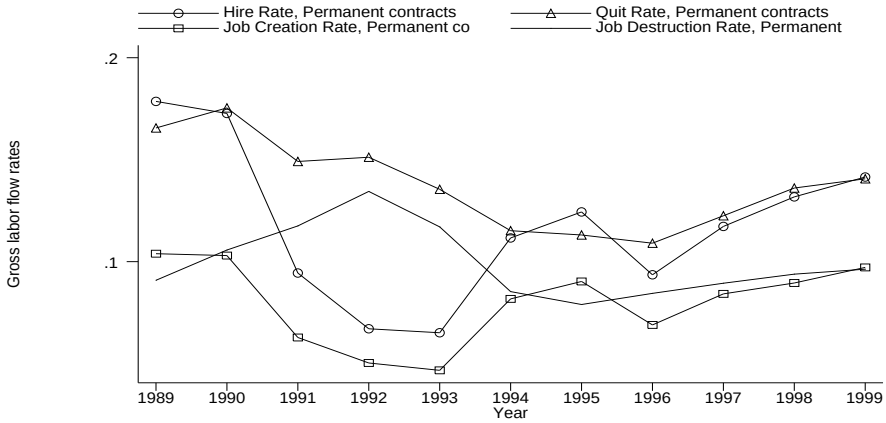

Figure 2. Job and Worker flows, permanent contracts

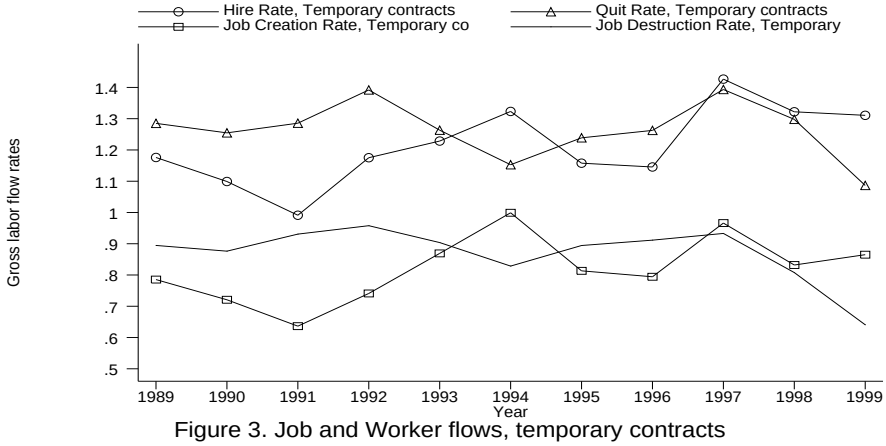

Figure 3. Job and Worker flows, temporary contracts